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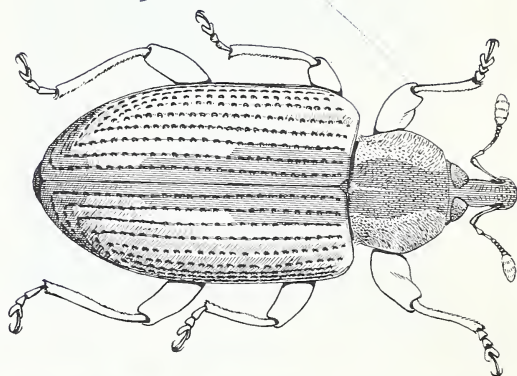
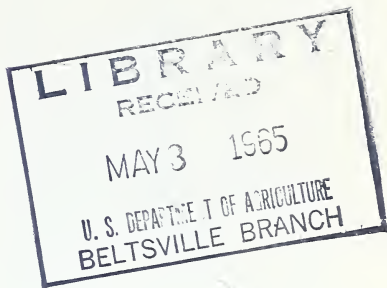
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THE ALFALFA WEEVIL

How To Control It





THE ALFALFA WEEVIL:

How To Control It

Alfalfa is the Nation's most valuable hay crop.

Farmers grow more of it today than any other legume. They prefer it for livestock feed because of its high yield, its palatability, its richness in protein, and its high content of calcium and vitamins.

But on many farmlands the larvae, or young, of the alfalfa weevil¹ and the adults take the nutritional value out of alfalfa by feeding on the plant tips, leaves, and buds. They prevent the profitable production of seed. They reduce crop yields and cause millions of dollars of damage each year.

NATURE OF DAMAGE

The larvae do the greatest damage to the first crop of alfalfa. They feed within the plant tips, on the upper leaves as they open, and then on the lower foliage, skeletonizing the leaves. Damaged leaves

dry rapidly and the field takes on a grayish to whitish cast.

After the first crop of alfalfa has been cut, the larvae crawl to the new shoots of the second crop and continue feeding. They retard new plant growth and may seriously damage the second crop. Newly emerged adults also feed on and severely damage the new shoots.

ORIGIN AND SPREAD

The alfalfa weevil was first found in the United States near Salt Lake City, Utah, in 1904. It has since spread throughout Utah and into Arizona, California, Colorado, Idaho, Kansas, Montana, Nebraska, Nevada, New Mexico, North Dakota, Oregon, South Dakota, Wash-

Photograph on cover: Alfalfa weevils chew up the tips, leaves, and buds on alfalfa plants. In so doing, they reduce crop yields and cause serious financial loss to growers.

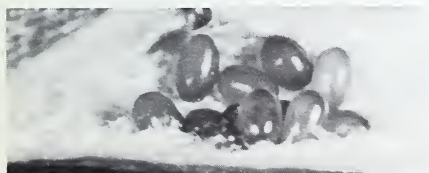
¹ *Hypera postica*.

ington, and Wyoming, and into the Provinces of Alberta and Saskatchewan in Canada. Between 1951 and 1964 it was found in these 25 States: Alabama, Arkansas, Connecticut, Delaware, Georgia, Illinois, Indiana, Kentucky, Louisiana, Maryland, Massachusetts, Mississippi, Missouri, New Hampshire, New Jersey, New York, North Carolina, Ohio, Pennsylvania, Rhode Island, South Carolina, Tennessee, Vermont, Virginia, and West Virginia.

The weevils spread by flying and crawling. Many are carried to haystacks during haying operations. They may move long distances by flight or in infested shipments of baled hay or other farm products.

DEVELOPMENT

Alfalfa weevils pass through egg, larval, pupal, and adult stages in their development. In most areas, they produce only one generation during each growing season. But in California and in some of the Northeastern and Southern States, they may have a partial second generation. When cold weather comes, the adults crawl down into the crowns of the alfalfa or seek other sheltered places in alfalfa fields, nearby ditchbanks, or field borders, where they overwinter.



BN-20796

Eggs.



BN-20795

Larva.



BN-20799

Adult.

In early spring, the weevils become active. Each female lays several hundred eggs in clusters—2 to 25 eggs in each cluster. In the Western States the weevils first lay a considerable number of eggs inside dead hollow stems of alfalfa, grass, and weeds lying on the ground. By the time the alfalfa is 6 inches tall, they have gradually shifted their egg laying to the growing stems. In the Northeastern and Southern States the weevils lay most of their eggs in the green alfalfa.

The eggs are oval and about one-fiftieth inch long. They are lemon yellow when first laid and brownish when ready to hatch. In warm weather they hatch in 1 to 2 weeks; in cool weather they accumulate in the fields until temperatures favorable to hatching occur.

Larvae appear in early spring and are most numerous from the time the plants are about 6 inches tall until they reach the early flowerbud stage of development. The peak of abundance varies with the season and in different areas of infestation. The newly hatched larvae are about one-twentieth inch long and are yellow, except for a shiny black head.

Larvae feed on alfalfa plants 3 to 4 weeks. During this time they molt, or shed their skins, three times. When full grown, they are about three-eighths inch long. Their heads are black; their bodies, green. They have a wide white stripe running down the middle of their backs paralleled by two faint white stripes on either side.

When they have finished feeding, the larvae spin cocoons about one-



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Weevil larvae feeding on alfalfa.

fourth inch long on the plants, or within the curl of fallen dead leaves, or in other litter on the ground. They pupate within the cocoons and change to adults. The adult weevils emerge in 1 to 2 weeks.

The adults are snout beetles and are about three-sixteenths inch long. At first they are brown, with a broad dark stripe extending down their backs from the front of their heads to more than half the length of their bodies. As the weevils age, many of them become uniformly dark brown or almost black.

Most of the old overwintering adults have died by the time the first crop has been harvested, although in certain areas some of them may survive to lay eggs in the second crop. Most of the young adults leave the alfalfa fields soon after emergence, and remain inactive dur-

ing the summer in protected places nearby. They return to alfalfa fields in the fall and mate at this time or the following spring.

The females lay most of their eggs in the spring. However, they lay some eggs in the fall before cold weather sets in. In the lower valleys of western Colorado, and in the Northeast and South, two-thirds to three-fourths of the females lay a considerable number of their eggs in the fall. Most of these eggs do not hatch until the following spring.

CONTROL

Once alfalfa weevils infest a field, they usually cause damage season after season—unless they are controlled. You can control them by following recommended crop-management practices and by applying insecticides.



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Left: Alfalfa that has been sprayed for alfalfa weevil control. **Right:** Untreated.

Crop Management

To reduce weevil damage—

- Grow dense, vigorous stands; follow approved cultural practices for alfalfa.

- Cut the first crop when most of the plants are in the bud stage.

- Cut plants clean and close.

Remove hay from fields promptly. A field free of crop remnants deprives larvae of food and shelter and exposes them to the sun. The exposure is usually fatal.

Insecticides

For best control, destroy weevil larvae by spraying the alfalfa in the spring when most of the growing tips are beginning to show damage. Apply one of the following insecticides in the amount shown:

<i>Insecticide</i>	<i>Amount of active ingredient to apply per acre</i>
Diazinon.....	1 pound.
Guthion.....	8 ounces.
Malathion.....	1 pound.
Methoxychlor.....	1½ pounds.
Parathion.....	4 ounces.

Prepare a spray with an emulsifiable concentrate of the insecticide by mixing it with water, according to directions on the container, to give you the proper dosage per acre. If you use a ground sprayer, you will need at least 10 gallons of spray per acre; if you make the application by airplane, you can use as little as 2 gallons per acre.

If large numbers of larvae and newly emerged adults are present when the first crop is harvested, spray the stubble as soon as the crop is removed.

When the pea aphid is likely to

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cause damage, apply a combination spray of malathion and methoxychlor in the amounts shown.

WEEVIL PARASITE

In parts of the Western States, a small black wasp, commonly called the weevil parasite,² often kills 80 to 90 percent of the larvae that appear at the beginning of the season. The weevil parasite lays its egg in the weevil larva; the parasite larva hatching from the egg feeds inside the host. A parasitized weevil larva dies soon after it spins its cocoon. The parasite larva then constructs a brown white-banded cocoon of its own.

After the first crop buds, parasitism declines and is negligible during the second crop.

The parasite has been introduced into Northeastern and Southern States and Ohio. It has become established at release sites in these States. Several other parasite species have also been introduced into these States. Some of them have become established, but it is too early (1965) to know how effective they will become in controlling the weevil.

² *Bathyplectes curculionis*.

PRECAUTIONS

Insecticides are poisonous. Use them only when needed and handle them with care. Follow the directions and heed all precautions on the container label.

Store insecticides in closed well-labeled containers and in a dry place where they will not contaminate food or feed and where children and pets cannot reach them.

When handling insecticides, avoid repeated or prolonged contact with the skin and inhalation of dusts and mists. After handling insecticides, wash hands and face before eating or smoking.

When handling concentrates, avoid spilling them on your skin and keep them out of your eyes, nose, and mouth. If you get insecticide on your skin, wash it off immediately with soap and water. If you spill insecticide on your clothing, remove clothing at once,



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A weevil parasite, above, kills 80 to 90 percent of the early-season larvae in the Western States.



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This farmer is spraying for control of weevil larvae.

and wash it before wearing it again. If insecticide gets in your eyes, flush eyes with plenty of water for 15 minutes and get medical attention.

If an insecticide is swallowed, or if a person suddenly feels sick while using an insecticide or shortly afterward, call a doctor immediately and show him the pesticide container and any attached labels.

Parathion and Guthion are extremely poisonous and may be fatal if swallowed, inhaled, or absorbed through the skin. They should be applied only by persons who are thoroughly familiar with their hazards and who will assume full responsibility for their safe use and comply with all precautions on the container label.

Wear a respirator of a type tested

by the U.S. Department of Agriculture and found satisfactory for protection against parathion and Guthion. A list of acceptable respirator devices is available from the Entomology Research Division, U.S. Department of Agriculture, Beltsville, Md., 20705.

To minimize losses of honey bees and other pollinating insects, make insecticide applications, if possible, when the insects are not visiting the plants. Avoid drift of insecticide sprays or dusts to bee yards and nearby crops in bloom.

Notify beekeepers at least 48 hours before dusting and spraying large acreages, so that measures can be taken to protect the bees.

To protect fish and wildlife, do not contaminate streams, lakes, or

ponds with insecticides. Do not clean spraying equipment or dump excess spray material near such water. Avoid drift of insecticide sprays or dusts to nearby crops or livestock, especially from applications by airplane and other power equipment. Do not let poultry, dairy animals, or meat animals feed on plants or drink water contaminated by drift of insecticides.

After applying one of the follow-

ing insecticides for alfalfa weevil control, wait the indicated number of days before cutting alfalfa or grazing animals on the treated alfalfa: Methoxychlor, 7 days; parathion, 15 days; Guthion, 21 days.

No waiting period is required for malathion. After applying diazinon, wait 2 days before grazing livestock and 10 days before cutting for hay.

Prepared by
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